

## CLAIMS

1. A semiconductor apparatus provided with at least one set of buried channel type first conductive  
5 type MOS transistor and surface channel type first conductive type MOS transistor on the same substrate, wherein a first conductive type impurity region is provided below a gate electrode of said buried channel type and surface channel type MOS transistors  
10 and between source and drain regions.

2. A solid state image pickup device comprising a pixel having a photoelectric conversion portion and a plurality of transistors formed in  
correspondence to said photoelectric conversion  
15 portion, on a substrate, wherein said plurality of transistors include a buried channel type first conductive type MOS transistor and a surface channel type first conductive type MOS transistor, and a first conductive type impurity region is provided  
20 below a gate electrode and between source and drain regions of said buried channel type and surface channel type MOS transistors.

3. A solid state image pickup device as claimed in claim 2, wherein said plurality of  
25 transistors include an amplifier transistor amplifying a signal from said photoelectric conversion portion, and said amplifier transistor is

constituted by said buried channel type MOS transistor.

4. A solid state image pickup device as claimed in claim 2, wherein said surface channel type  
5 MOS transistor has a second conductive type semiconductor region in a side closer to a substrate surface than said first conductive type semiconductor region.

5. A solid state image pickup device as  
10 claimed in claim 4, wherein a doze amount of said first conductive type semiconductor region is smaller than a doze amount of said second conductive type semiconductor region.

6. A solid state image pickup device as  
15 claimed in claim 3, wherein said amplifier transistor is constituted by a source follower MOS transistor forming an output stage of said pixel portion.

7. A solid state image pickup device as claimed in claim 2, wherein a gate electrode of said  
20 buried channel type MOS transistor is made of a polysilicon in which an impurity of a second conductive type opposite to said first conductive type is injected, and a gate electrode of said surface channel type MOS transistor is made of a poly-silicon  
25 in which the first conductive type impurity is injected.

8. A solid state image pickup device as

claimed in claim 2, wherein said first conductive type semiconductor regions of said buried channel type MOS transistor and the surface channel type MOS transistor have the same density profile.

- 5           9.    A solid state image pickup device as claimed in claim 2, wherein said first conductive type semiconductor region is formed in the same step.

10.   An image pickup system comprising:  
          an image forming optical system forming an  
10 image from a light from an object;  
          the solid state image pickup device as claimed in claim 2 for converting the formed image in a photoelectrical manner; and  
          a signal processing circuit for digitally  
15 converting and an output signal from the solid state image pickup device.